

L3 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2002 ACS
AN 2002:369003 CAPLUS
DN 136:387091
TI Method for manufacturing wet type friction material
IN Takahara, Hiroshi; Matsuda, Shunya
PA NSK-Warner K.K., Japan
SO U.S. Pat. Appl. Publ., 8 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM C08J005-14
NCL 523149000
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 43

12/18/02

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	US 2002058728	A1	20020516	US 2001-987114	20011113 <--
	JP 2002147509	A2	20020522	JP 2000-386145	20001113
PRAI	JP 2000-386145	A	20001113		
AB	A method for manufg. a wet type friction material obtained by impregnating binding agent into a paper body comprised of fiber base material and filler comprises a first impregnating step for impregnating first binding agent into the paper body, a second impregnating step for impregnating second binding agent into the paper body after the first impregnating step and a heating and curing step for heating and curing the paper body into which the first and second binding agents were immersed.				
ST	friction material paper				
IT	Polyamide fibers, uses				
	RL: TEM (Technical or engineered material use); USES (Uses)				
	(aramid; method for manufg. wet type friction material)				
IT	Phenolic resins, uses				
	RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)				
	(binder; method for manufg. wet type friction material)				
IT	Fibers				
	RL: TEM (Technical or engineered material use); USES (Uses)				
	(cellulosic; method for manufg. wet type friction material)				
IT	Binders				
	Friction materials				
	Paper				
	(method for manufg. wet type friction material)				
IT	Diatomite				
	RL: TEM (Technical or engineered material use); USES (Uses)				
	(method for manufg. wet type friction material)				
IT	29159-37-3, 3-Aminopropyl triethoxy silane homopolymer				
	RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)				
	(binder; method for manufg. wet type friction material)				
IT	1344-28-1, Alumina, uses				
	RL: TEM (Technical or engineered material use); USES (Uses)				
	(method for manufg. wet type friction material)				
RN	29159-37-3				
RN	1344-28-1				

L3 ANSWER 2 OF 2 WPIDS (C) 2002 THOMSON DERWENT
AN 2002-665097 [71] WPIDS
DNC C2002-186735
TI Manufacture of wet type friction material for use in clutch of, e.g. motor vehicles, by respectively immersing first and second binding agents into

paper body.

DC A88 Q63 Q64

IN MATSUDA, S; TAKAHARA, H

PA (BORW) NSK WARNER KK

CYC 2

PI US 2002058728 A1 20020516 (200271)* 8p C08J005-14
 JP 2002147509 A 20020522 (200271) 7p F16D069-00

ADT US 2002058728 A1 **US 2001-987114 20011113**; JP 2002147509 A JP
 2000-386145 20001113

PRAI JP 2000-386145 20001113

IC ICM C08J005-14; F16D069-00
 ICS C09K003-14; F16D013-62; F16D025-0635; F16D069-02; F16H045-02

ICI C08L087:00

AB US2002058728 A UPAB: 20021105
 NOVELTY - A wet type friction material is manufactured by respectively
 immersing first and second binding agents into a paper body. The paper
 body comprises fiber base material and filler. It is then heated and cured
 after the second immersion step.
 USE - The method is used for manufacturing a wet type friction
 material for use in friction engagement elements of clutch of, e.g. motor
 vehicles, multi-plate clutch or lock-up clutch.
 ADVANTAGE - The combination of the two different binding agents
 provides an excellent wet type friction material. It suppresses weakness
 or tenderness while maintaining elasticity or flexibility.
 DESCRIPTION OF DRAWING(S) - The figure is an enlarge view showing a
 main part of a friction plate.
 Second layer 4
 First layer 5
 Dwg.1/6

FS CPI GMPI

FA AB; GI

MC CPI: A11-C02; A12-H10; A12-T04D

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(FILE 'HOME' ENTERED AT 16:17:46 ON 08 JUN 2002)

FILE 'CAPLUS, WPIDS' ENTERED AT 16:17:54 ON 08 JUN 2002
E JP2000-386145/AP,PRN

L1 1 FILE CAPLUS
L2 0 FILE WPIDS
TOTAL FOR ALL FILES
L3 1 S E3-E4

FILE 'REGISTRY' ENTERED AT 16:21:32 ON 08 JUN 2002

L4 1 S 29159-37-3/RN
SET NOTICE 1 DISPLAY
SET NOTICE LOGIN DISPLAY

FILE 'REGISTRY' ENTERED AT 16:22:17 ON 08 JUN 2002

L5 1 S 1344-28-1/RN
SET NOTICE 1 DISPLAY
SET NOTICE LOGIN DISPLAY

FILE 'CAPLUS' ENTERED AT 16:29:17 ON 08 JUN 2002

L6 5950 S ((FRICTION MATERIAL?) OR CLUTCH)
L7 2333 S L6 AND (PAPER? OR FIBR? OR FIBER?)
L8 42 S L7 AND (PHENOL RESIN?)
L9 1 S L8 AND (SILICON? OR L4)

FILE '1MOBILITY' ENTERED AT 16:38:05 ON 08 JUN 2002

FILE '1MOBILITY, 2MOBILITY' ENTERED AT 16:38:17 ON 08 JUN 2002

L10 1387 FILE 1MOBILITY
L11 74 FILE 2MOBILITY
TOTAL FOR ALL FILES
L12 1461 S ((FRICTION MATERIAL?) OR CLUTCH?)
L13 541 FILE 1MOBILITY
L14 0 FILE 2MOBILITY
TOTAL FOR ALL FILES
L15 541 S L12 AND (PAPER? OR FIBR? OR FIBER?)
L16 3 FILE 1MOBILITY
L17 0 FILE 2MOBILITY
TOTAL FOR ALL FILES
L18 3 S L15 AND PHENOL?
L19 4 FILE 1MOBILITY
L20 0 FILE 2MOBILITY
TOTAL FOR ALL FILES
L21 4 S L15 AND (SILICON? OR ?SILANE?)
L22 4 FILE 1MOBILITY
L23 0 FILE 2MOBILITY
TOTAL FOR ALL FILES
L24 4 S L15 AND (SILICON? OR SILANE? OR AMINOSILANE?)

FILE 'PAPERCHEM2' ENTERED AT 16:41:46 ON 08 JUN 2002

L25 153 S L15
L26 32 S L25 AND PHENOL?
L27 29 S L25 AND (SILICON? OR SILANE? OR AMINOSILANE?)
L28 10 S L26 AND L27
L29 10 FOCUS L28 1-

FILE 'USPATFULL' ENTERED AT 16:47:20 ON 08 JUN 2002

L30 108 S 427/382000/NCL
L31 479 S L28
L32 146 S L31 AND ?SILANE?

L33	131 S L32 AND (FIRST OR SECOND)
L34	278 S 427/411000/NCL
L35	479 S L28
L36	0 S L35 AND L30
L37	0 S L35 AND L34

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L29 ANSWER 1 OF 10 PAPERCHEM2 COPYRIGHT 2002 ELSEVIER ENGINEERING INFORMATION INC.

AN 96:27394 PAPERCHEM2

SN 000564250

DN UNPUBLISHED

TI **Friction Material** Comprising Powdered Phenolic Resin and Method of Making Same

IN Yesnik, M. A.

PI US 5529666 19960625

AI US 1995-451668 19950526

PRAI US 1993-114871 19930831

SO p. 16. 5 claims.

DT Patent

LA English

AB A process for making an asbestos-free **friction material** comprises adding at least one **phenolic** or **phenolic-modified resin** to an aqu. **papermaking slurry** including **fibers** and filler; sheeting out the slurry; impregnating the resultant porous sheet with a **silicone resin**; and then heating the web to cure the **phenolic** and **silicone resins**. The **friction material** is of use in **clutch plates**, **brake shoes**, and the like.

NCL 152-136

CT ADDITIVES; BRAKES; **CLUTCHES**; ENGLISH; FRICTION; IMPREGNANTS; **PAPER MAKING**; PATENTS; POLYCONDENSATES; POLYPHENOLICS; POLYSILICONES; RESIN IMPREGNATED **PAPERS**; **SILICON COMPOUNDS**; SYNTHETIC POLYMERS; THERMOSETS; WET END ADDITIVES

L29 ANSWER 2 OF 10 PAPERCHEM2 COPYRIGHT 2002 ELSEVIER ENGINEERING INFORMATION INC.

AN 80:4151 PAPERCHEM2

SN 000153232

DN AB5104151

TI **FRICTION MATERIALS**

IN Joyama, Y.; Yoshii, K.; Teijin Ltd.

PI JP 54118448 19790913

AI JP 1978-25477 19780308

SO p. 3.

DT Patent; (UNAVAILABLE DOCUMENT)

FS PAPERCHEM

LA Japanese

AB Abrasion-resistant **friction materials** are prepared by blending aromatic polyamide **fibers** with composition containing asbestos **fibers** and pulp and impregnating the **paper** formed from the blend with a **phenolic resin**. Thus, a blend containing Konex **fibers** (30%), asbestos **fibers** (20%), linters pulp (20%), and a friction-increasing agent (30%) was passed through a **paper machine**, impregnated (20%) with a **phenolic resin**, and molded to give an abrasion-resistant disk for automobile **clutch facings**, whereas a disk molded from similar **papers** without Konex **fibers** was not abrasion-resistant. From: C.A. 92, no. 4: abstr. 24,665 (Jan. 28, 1980); copyright Am.Chem.Soc.

IC C08J005-14

NCL C08J5-14

CT ABRASION RESISTANCE; AROMATIC COMPOUNDS; ASBESTOS; AUTOMOBILES; **CLUTCHES**; DISKS; FORMING; FORMULATIONS; FRICTION; IMPREGNATED **PAPERS**; IMPREGNATION; INORGANIC **FIBERS**; JAPAN; JAPANESE; LINTERS; MECHANICAL PROPERTIES; MINERAL **FIBERS**; MIXING; MIXTURES; MOLDING; PATENTS; POLYAMIDES; POLYCONDENSATES; POLYPHENOLICS;

PULPS; SHEET FORMING; SILICATES; SILICON COMPOUNDS; SYNTHETIC
POLYMERS; THERMOPLASTICS; THERMOSETS; TRADE NAMES; VEHICLES

L29 ANSWER 3 OF 10 PAPERCHEM2 COPYRIGHT 2002 ELSEVIER ENGINEERING INFORMATION
INC.

AN 84:11300 PAPERCHEM2

SN 000210331

DN AB5511300

TI Wet Friction Materials

IN Aisin Kako Co. Ltd.

PI JP 59080539 19840510

AI JP 1982-189867 19821028

SO p. 4.

DT Patent; (UNAVAILABLE DOCUMENT)

FS PAPERCHEM

LA Japanese

AB A heat-resistant and durable wet friction material
for an automatic transmission is prepared from silane coupling
agent-treated paper containing cellulose fibers and
rock wool. Thus, a base sheet comprising 30 parts rock wool, 20 parts
pulp, and 20 parts diatomite was treated with 1% silane coupling
agent in MeOH, dried at 100 C for 30 min, impregnated with 30 parts
phenolic resin, precured at 160 C for 40 min, and pressed with an
adhesive-coated metal core at 170 C for 10 min to give a friction
material. From: C.A. 101, no. 12: abstr. 92,507 (Sept. 17, 1984);
copyright Am.Chem.Soc.

IC F16D069-00

NCL F16D69-00

CT CLUTCHES; COUPLING AGENTS; DIATOMACEOUS EARTH; FRICTION; HOT
PRESSING; INORGANIC FIBERS; JAPAN; JAPANESE; MECHANICAL
PROPERTIES; MINERAL FIBERS; PATENTS; SILANES;
SILICON COMPOUNDS; THERMAL PROPERTIES; THERMAL RESISTANCE

L29 ANSWER 4 OF 10 PAPERCHEM2 COPYRIGHT 2002 ELSEVIER ENGINEERING INFORMATION
INC.

AN 80:10104 PAPERCHEM2

SN 000159185

DN AB5110104

TI LIGNIN-MODIFIED FRICTION MATERIAL

IN Jacko, M. G.; Gager, R. F.; Bendix Corp.

PI US 4239666 19801216

AI US 1979-17012 19790302

PRAI US 1977-842870 19771017

US 1975-570106 19750421

SO p. 11. 13 claims.

DT Patent

FS PAPERCHEM

LA English

AB A molding composition of use in forming a friction
material for brakes includes asbestos, an organic modifier such as
rubber scraps or molasses, an inorganic modifier such as talc or alumina,
cashew nut powder, a thermosetting phenolic resin, and 2-15%
(based on weight of the molded friction material) of
lignin. The lignin used can be kraft lignin modified with urea or with
urea and HCHO, or it can be a LS modified with HCHO or with
hexamethylenetetramine with or without initial modification with urea or
ammonia. Use of the lignin reduces the need for the phenolic
resin, increases the wear life of the friction material
, and provides a molded product which maintains a uniform coefficient of
friction over the thermal operating range of a vehicle brake lining.

NCL 260-17.5

CT ALDEHYDES; ALKALI LIGNINS; ALUMINUM COMPOUNDS; ALUMINUM OXIDE; AMIDES;

AMINES; AMMONIA; ASBESTOS; BRAKES; ELASTOMERS; ENGLISH; FORMALDEHYDE;
FRICTION; HYDROGEN COMPOUNDS; HYDROLYSIS LIGNINS; INORGANIC FIBERS
; LIFE; LIGNINS; LIGNOSULFONATES; MINERAL FIBERS; MOLASSES;
MOLDING MATERIALS; NITROGEN COMPOUNDS; OXIDES; OXYGEN COMPOUNDS; PATENTS;
POLYCONDENSATES; POLYPHENOLICS; RUBBER; SERVICE LIFE; SILICATES;
SILICON COMPOUNDS; SULFONATES; SULFUR COMPOUNDS; TALC;
THERMOPLASTICS; THERMOSETS; UNITED STATES; UREA; UREAS; WEAR

L29 ANSWER 5 OF 10 PAPERCHEM2 COPYRIGHT 2002 ELSEVIER ENGINEERING INFORMATION
INC.

AN 96:905 PAPERCHEM2

SN 000537681

DN AB6616226

TI **Friction Material**

IN Shibata, K.; Azuma, Y.; Suzuki, T.

PI GB 2224285 19900502

AI GB 1989-20619 19890912

PRAI JP 1988-228079 19880912

SO p. 20. 9 claims.

DT Patent

FS PAPERCHEM

LA English

AB High temp. stability, favorable wear properties, and superior antifade
properties are exhibited by brake pads made from a **friction**
material containing 0.85-30% by wt. of carbon **fibers**
(CF) and 2-20% of aramide **fibers** (AF). A mixture of AF pulp and
chopped AF is used at less than 1.67 times the CF content by wt., with CF
content more than 1.0% by wt. The composition includes 10-50% by wt. of
copper, nickel, copper-zinc alloy, copper-tin alloy, or iron or mixtures
thereof; 5-20% by wt. of graphite, molybdenum disulfide, zinc sulfide,
lead sulfide, antimony trisulfide, mica, or boron nitride or mixtures
thereof; 10-50% by wt. of a combination of **silicon** dioxide,
alumina, mulite, magnesium oxide, zirconium oxide, or Spinel-structured
ferrite and barium sulfate, calcium carbonate, or cupric oxide or mixtures
thereof; 3-20% by wt. of melamine dust, polyimide dust, cashew dust, or
phenol dust or mixtures thereof; and 8-15% by wt. of
phenol resin.

IC C09K003-16

NCL C09K3-16

CT ABRASION RESISTANCE; ARAMIDE FIBERS; BRAKES; CARBON
FIBERS; DISKS; DURABILITY; ENGLISH; INORGANIC FIBERS;
MAN MADE FIBERS; MECHANICAL PROPERTIES; PATENTS; PRDS; SPECIALTY
PAPERS; SYNTHETIC FIBER PAPERS; THERMAL
PROPERTIES; THERMAL STABILITY

L29 ANSWER 6 OF 10 PAPERCHEM2 COPYRIGHT 2002 ELSEVIER ENGINEERING INFORMATION
INC.

AN 80:8955 PAPERCHEM2

SN 000158036

DN AB5108955

TI LIGNIN-MODIFIED **FRICTION MATERIAL**

IN Jacko, M. G.; Gager, R. F.; Bendix Corp.

PI CA 1085980 19800916

AI CA 1976-250523 19760420

PRAI US 1975-570106 19750421

SO p. 24. 12 claims.

DT Patent

FS PAPERCHEM

LA English

AB A **friction material** such as a brake-lining material
is molded from a composition consisting of 25-55 vol.% of a foundation
material such as asbestos, 8-70 vol.% of modifier materials such as rubber

scraps or asphaltic base materials, and 10-47 vol.% of a thermosetting **phenolic** resin binder containing up to 30 vol.% of an extender such as a lignosulfonate or a kraft lignin.

NCL 400-21

CT ALKALI LIGNINS; ASBESTOS; ASPHALT; BINDERS; BITUMEN; BRAKES; CANADA; ELASTOMERS; ENGLISH; EXTENDERS; FRICTION; HYDROLYSIS LIGNINS; INORGANIC **FIBERS**; LIGNINS; LIGNOSULFONATES; LINERS; MINERAL **FIBERS**; MOLDING; PATENTS; POLYCONDENSATES; POLYPHENOLICS; RUBBER; SILICATES; **SILICON** COMPOUNDS; SULFONATES; SULFUR COMPOUNDS; THERMOPLASTICS; THERMOSETS

L29 ANSWER 7 OF 10 PAPERCHEM2 COPYRIGHT 2002 ELSEVIER ENGINEERING INFORMATION INC.

AN 78:10115 PAPERCHEM2

SN 000137746

DN AB4910115

TI LIGNIN-MODIFIED **FRICTION MATERIAL**

IN Bendix Corp.

PI GB 1529091 19781018

AI GB 1976-16152 19760421

PRAI US 1975-570106 19750421

SO p. 13. 14 claims.

DT Patent

FS PAPERCHEM

LA English

AB A molded **friction material** (e.g., a brake-lining material) consists of a foundation material (e.g., asbestos) for providing internal strength, modifiers (e.g., rubber scraps, talc, alumina, etc.) for controlling the wear rate and other characteristics, and a thermosetting binder consisting of a **phenolic** resin and/or cashew nut powders, and an extender comprising LS or kraft lignin, or their derivatives, such as LS modified with hexamethylenetetramine and kraft lignin modified with urea.

CT ALUMINUM COMPOUNDS; ALUMINUM OXIDE; AMIDES; AMINES; ASBESTOS; BINDERS; BRAKES; ELASTOMERS; ENGLISH; EUROPE; EXTENDERS; FRICTION; GREAT BRITAIN; INORGANIC **FIBERS**; LIGNINS; LIGNOSULFONATES; LINERS; MECHANICAL PROPERTIES; METHYLENE GROUPS; MINERAL **FIBERS**; MODIFIERS; NITROGEN COMPOUNDS; OXIDES; OXYGEN COMPOUNDS; PATENTS; POLYPHENOLS; RUBBER; SILICATES; **SILICON** COMPOUNDS; SULFONATES; SULFUR COMPOUNDS; TALC; THERMOPLASTICS; THERMOSETS; UREA; UREAS; WEAR

L29 ANSWER 8 OF 10 PAPERCHEM2 COPYRIGHT 2002 ELSEVIER ENGINEERING INFORMATION INC.

AN 89:8487 PAPERCHEM2

SN 000274668

DN AB6008487

TI Water-Laid Friction Facing Material

IN McKenzie, N. C.; Baker, R. (Ferodo Ltd. (Manchester: England: UK))

PI GB 2205592 19881214

AI GB 1987-13713 19870611

SO p. 11. 9 claims.

DT Patent

FS PAPERCHEM

LA English

AB An asbestos-free friction **paper** for use in facing **clutches** and the like which are to operate in oil is formed from a furnish including the following ingredients, the amounts shown being preferable: wood pulp, 3-7 wt.%; diatomite, 12-25 wt.%; cardolite, 6-18 wt.%; inorganic silicate **fibers**, 25-50 wt.%; thermosetting resin such as a **phenolic** resin, 20-40 wt.%; and graphite, 10-30 wt.%.

CT **CLUTCHES**; DIATOMACEOUS EARTH; ENGLISH; EUROPE; FACINGS; FRICTION; GRAPHITE; GREAT BRITAIN; INORGANIC **FIBERS**; MINERALS;

OIL; PABD; PATENTS; PULPS; SILICATES; SILICON COMPOUNDS;
THERMOSETS

L29 ANSWER 9 OF 10 PAPERCHEM2 COPYRIGHT 2002 ELSEVIER ENGINEERING INFORMATION
INC.

AN 67:7792 PAPERCHEM2

SN 000007792

DN AB3807792

TI FRICTION ELEMENTS AND METHODS OF THEIR MANUFACTURE

IN Borg-Warner Corp.

PI GB 1078773 19670809

SO p. 6. 9 claims..

DT Patent

FS PAPERCHEM

LA English

AB A process for making a porous friction matl. suitable for forming a
facing for a wet **clutch** comprises mixing asbestos **fibers**
with a binder soln. and a friction-enhancing matl., evapg. the solvent,
and curing the binder. The binder can be a soln. of a **phenolic**
resin in ethanol, and the friction-enhancing matl. can be barytes.

CT ADHESIVES; ASBESTOS; BINDERS; **CLUTCHES**; DRIVES; FACINGS;
FIBERS; FRICTION DRIVES; INORGANIC **FIBERS**; MECHANICAL
DRIVES; MINERAL **FIBERS**; SILICATES; SILICON COMPOUNDS;
GREAT BRITAIN; ENGLISH; PATENTS

L29 ANSWER 10 OF 10 PAPERCHEM2 COPYRIGHT 2002 ELSEVIER ENGINEERING
INFORMATION INC.

AN 72:3493 PAPERCHEM2

SN 000057264

DN AB4303493

TI FRICTION ELEMENTS AND METHODS OF THEIR MANUFACTURE

IN Albertson, C. E.; Okubo, H. S.

PI US 3647722 19720307

SO 9 claims..

DT Patent

FS PAPERCHEM

LA English

AB A sheet of use as a wet **clutch** friction matl. is made by
felting a slurry contg. asbestos **fibers** and a friction modifier
such as barytes or cashew nut shell resin granules, the slurring medium
being a solvent in which is dissolved a **phenolic** resin. After
the matl. is felted, the solvent is evapd. out and the resin is set by
heating.

CT ABRASIVES; ALKALINE EARTH METAL COMPOUNDS; ASBESTOS; BARIUM COMPOUNDS;
BARIUM SULFATE; DRIVES; FELTS; FRICTION DRIVES; GRANULES; INORGANIC
FIBERS; MANUFACTURE; MECHANICAL DRIVES; MINERAL **FIBERS**;
PATENTS; POLYCONDENSATES; POLYPHENOLICS; SILICATES; SILICON
COMPOUNDS; SLURRY; SOLVENTS; SULFATES; SULFUR COMPOUNDS; THERMOSETS;
UNITED STATES; WOVEN FABRIC; ENGLISH

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